DOCUMENT RESUME

ED 306 780 FL 017 988

AUTHOR Thrush, Emily A.; Hardisty, David
TITLE Computer Networks for Language Learning: The Creation of Meaning through Interaction.
PUB DATE 89
NOTE 17p.
PUB TYPE Reports - Evaluative/Feasibility (142) -- Viewpoints (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Class Activities; *Classroom Techniques; *Computer Assisted Instruction; *Computer Networks; Computer Software; Freshman Composition; Higher Education; *Interaction; Language Processing; Microcomputers; Program Descriptions; Word Processing; Writing (Composition); *Writing Instruction
IDENTIFIERS Georgia Institute of Technology; University of Southern California

ABSTRACT

Computer networking has made many new activities available to language learners. While these innovations are practical, they are also grounded in theory and justifiable on sound principles of language learning. Computers make possible classroom activities maximizing the benefit drawn from complex and otherwise unmanageable communicative interactions. Depending on its capabilities, a computer network can provide for interaction between a user and databases, bibliographic sources, or information sources; between user and other users; between user and various experts; and through word processing, between user and text. Local area networks which usually consist of a number of computers linked together in one room, provide the potential for a variety of student activities, including manipulating text, sharing work, creating text, and conferencing. The Georgia Institute of Technology English and Political Science departments have set up a system on the Wide Area Network that serves as an adjunct to class instruction by providing accessible services such as electronic mail and electronic bulletin boards. The software for a University of Southern California freshman composition program uses a notebook metaphor allowing students to sit at a microcomputer to plan, organize, research, and write a paper on an assigned topic. Various other networking projects both current or projected are discussed. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

COMPUTER NETWORKS FOR LANGUAGE LEARNING:

THE CREATION OF MEANING THROUGH INTERACTION

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Thrush, E.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Emily A. Thrush
Georgia Institute of Technology
and
David Hardisty
British Council

ED306780

Many language programs currently have access to some kind of computer laboratory, often with computers or work stations networked together and connected to a large storage device such as a hard disk. The most common usage of such a laboratory is as a word processing facility, with the word processing software located on the storage device and the students' text saved on individual floppy disks. A network makes a word processing lab much easier to run, because there is no need for students to fumble with floppy disks, the software runs much faster on a unit with large amounts of RAM storage, and students usually need to learn fewer commands and procedures to operate the system. These benefits may, in themselves, justify the investment in networking hardware and software, but they certainly do not begin to take advantage of the capabilities of a sophisticated, or even of a primitive network.

The mere fact, however, that advancements in technology have made new and different activities possible in the laboratory does not in itself justify these activities, though many teachers may feel pushed into incorporating them into their repertoires of techniques simply to satisfy administrators who see major investments of resources when they look at these labs, or students who may think that more and newer technology is intrinsically better. It turns out, rather happily, that proper use of computer networking is, in fact, thoroughly grounded in theory, and justifiable on very sound principles of language learning.

CREATION OF MEANING

One of the motivating factors behind the development of the widely accepted and practiced process approach to composition instruction was the somewhat revolutionary idea that meaning was not simply created in the writer's mind, but resulted from the interaction of a writer with a specific audience. The same concept underlay the functional approach to teaching language in which the speaker learned strategies which would elicit a desired response in the listener, i.e. a request for information got the listener to give the information, an invitation garnered either an acceptance or a rejection and different ways of issuing an invitation were appropriate with different audiences and for different purposes. Classroom strategies that accompanied these approaches included role-playing, small group and pair work, and peer review of compositions. These strategies have been widely

FL017988

used to promote the creation of meaning through interaction of speaker with listeners and writer with readers.

Less often exploited, however, are other types of interaction essential to meaning and communication. These include the interaction of the writer/speaker with knowledge in any of its many forms, with other users of the languages besides those specifically designated as the target audience, and with the speaker/writer's own words and consciousness. The following are some of the possible influences on the creation of meaning and the usage of language, but this is not intended as a comprehensive list:

- "Experts" - This includes anyone with greater knowledge than the learner in a content area, in language use, or in writing skills. The expert may be a teacher, another learner, a "casual" person the learner seeks out or encounters. The expert may help shape meaning by providing further information, by reacting to the speaker/writer's work, by commenting on it or correcting it, or by encouraging the speaker/writer to go in new directions.

- Knowledge - This may come from other sources than an "expert", including books, magazines, other written material, radio, t.v., computer databases, the learner's own experiences and previously acquired knowledge, etc. Without knowledge, the writer has nothing to write about, the speaker has no substance for conversation. As the speaker/writer gains knowledge, it is not simply added incrementally to the file of knowledge already acquired, but causes re-evaluation of all previous knowledge, and, indeed, of the learner's concept of the world. The newly reformed concept then shapes all succeeding expressions of meaning.

- Text - Good writers do not merely express pre-formed meaning, but evolve meaning as they create text because each expression of thought triggers new ideas and clarifies the writer's thought processes. Words on paper become a concrete expression of elusive or unformed thought and often act as newly encountered ideas in the formation of meaning.

- Self - a writer must develop a construct of the intended audience, determining what schema the audience will use in approaching the text, making decisions about what the audience needs and wants to know and translating all this into an effective approach to communicating with the audience. The writer must also keep in mind a set of purposes - those of the reader as well as those of the writer, and often those of an organization or discourse community as well (Blyler, 1988). The writer conducts an internal dialogue throughout the creation of the text, questioning whether what has been written fits that construct of the reader and meets those purposes, adjusting the constructed paradigm

of the reader's knowledge as the reader learns from the writer's text. The purpose of peer evaluation in composition classes is to help unsophisticated writers build skills in developing these constructs, but eventually the process must be internalized for the writer to become truly competent.

Successful communication, then, results from a complex set of relationships and interactions. These interactions might be diagrammed thusly:

Knowledge

Text Writer/Speaker Experts

Self

The arrows indicate these relationships are reciprocal, as the writer/speaker also influences the ideas of the "experts", contributes to the total body of knowledge, and, of course, modifies the text itself. In addition, every internal examination, the completion of every act of communication changes the writer/speaker into a more competent, sophisticated user of the language.

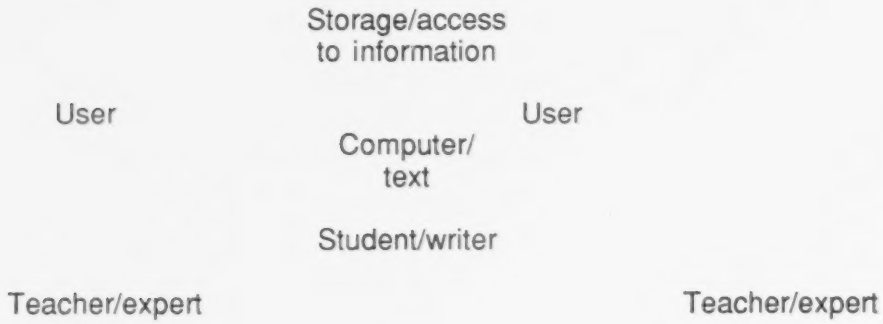
Because of the complexity of these interactions, it is difficult to set up classroom activities that effectively and efficiently maximize all. In a writing class, a set of activities may be designed for this purpose - including library research for knowledge, out-of-class writing for self and text, peer evaluation groups with teacher "facilitation" for interaction with experts, then more out-of-class writing to incorporate new knowledge about the audience and the language into the writer's communion with the text and self. However, these activities must usually take place discretely, and often with considerable passage of time between them so that the student writer may have difficulty internalizing the process into a cohesive whole that can be applied to other writing tasks.

Conversational skill development presents even greater difficulties because of the immediacy of the task, which prevents the learning speaker from adequate interaction time with all the sources of meaning. Input from other members of the conversation happen too rapidly to permit modification of the model of knowledge or of the audience and purpose by the unskilled language learner.

COMPUTER NETWORKS

One emerging aid to the language teacher in helping language learners develop the ability to use these interactions in creating meaningful communication is the computer network. A computer network, depending on its capabilities, may provide for interaction between a user and the knowledge contained in databases, bibliographic sources, or informational sources; between the user and other users; between the user and various experts; and, through word processing, between the

user and the text. Evidence exists that word processing also promotes interaction of writer with self by providing an environment that promotes concentration, and by making change and revisions in response to the internal dialogue easier. This might be represented by the following diagram:



Development of network use is in its infancy, but even now, it provides some opportunities for the teacher and the learner that are almost impossible to achieve otherwise. In this article, we would like to present some ideas for the current state of technology as it is most widely available, then look at an ongoing project that indicates the future of network use for language learning. Although many other activities for language learning, such as the use of Storyboard type programs, database software, etc., are possible on networks, because of space considerations text processing will be the primary focus here.

TERMS DEFINED

Many of the terms used in talking about networks are used in different ways depending on the setting. The following terms are defined as they will be used here.

- LAN (Local Area Network) - While in business settings the computers connected in a LAN may be in different rooms, or on different floors of the building, in academic settings a LAN usually consists of a number of computers or terminals in one room, linked together and usually linked to a file server.

- WAN (Wide Area Network) - Most college and university campuses have a campus wide network running off one or more mainframes. This WAN usually has facilities for electronic mail and bulletin boards as well as powerful programming and number crunching capabilities.

- File Server - A file server is simply a large storage unit, such as the hard disk drive on a microcomputer, or a separate "box" . The programs commonly needed by the network users are stored on the

file server so that users can call them up on each of the stations without having to fumble with multiple floppy disks. Users may also have storage space on the file server and may or may not have access to each others' storage space, depending on how you choose to set it up. This can facilitate having students look at each others' files for peer review, commentary, or idea sharing.

- Work station - Work station has come to mean may things, but it will be used here to indicate any microcomputer or terminal linked to a network. It is the combination of devices always including a monitor and keyboard, sometimes including disk drives and a printer, that allows the user to access the network.

- Electronic mail - E-mail is simply a message sending service. The planning, management, and programming behind an e-mail service can be quite complex, but the concept is simple. You type a message, indicate who you want it sent to, press a key, and it's sent. In return, you are notified when you have a message, and can choose to read it, answer it, delete it or save it. E-mail services can be set up on LAN's, and almost always exist on WAN's. In addition, there are national and international e-mail services such as Bitnet that link most institutions of higher education, and commercial services that provide access to information, e-mail, and bulletin boards for a fee.

- BB's (Bulletin Boards)- Bulletin boards provide a place for users to post messages to be seen by all other users of the network. Users can choose to read all messages, read an individual message, or post a message of their own.

IDEAS FOR LAN'S

MANIPULATING TEXT

One advantage of having students wordprocess on a network is that the instructor can enter material onto the network file server, give students instructions for pulling up the material onto their screens and manipulate it in some way. This is a good precursor to having students use the word processor to create their own, original material because they become familiar with word processing commands a few at a time. For example:

1. To introduce students to the word processor, you can enter some passages of text containing the kinds of errors the students often make. Students then use editing commands to correct the errors. It is easier for students to learn how to edit before they start worrying about creating and saving files; and when they start producing original work, they can concentrate on composing rather than on learning new commands.

2. You can create a cloze exercise by entering a passage appropriate to the age, abilities, and interests of your students, but leaving blank spaces where several of the nouns, verbs, and adjectives go. Indicate whether the word should be a noun, verb, or adjective. For example, "The dog was playing with a large _____(noun)". Or leave the indicators out if you want this to be an exercise in determining part of speech by context. The students, working in small groups, fill in the blanks with the words of their choice. Then they can print out the final version and share it with the class. The class might vote on the best story, silliest, etc. This exercise provides word processing practice in moving around the text, inserting, deleting, and printing out files. It also gives the students a good idea of how easy it is to edit on the word processor, and provides them an opportunity to share their work, to feel proud of it, and to improve reading and listening skills as well as their writing skills.

4. Enter a poem with a simple rhyme scheme ("Mary had a Little Lamb" for younger students, for example) but with the lines scrambled. Students attempt to put the lines in order. This provides practice in moving text, as well as in rhetorical analysis and phonetics ("go" rhymes with "snow" because "o" and "ow" can spell the same sound). More advanced students might be asked to fill in the last line of a limerick, again sharing the results with the class.

5. You can enter a passage written in a particular style, then give students directions for rewriting in another style. For example, a passage with mostly passive verbs can be rewritten in the active, short simple sentences can be combined with transitional words or phrases, passages using "he" as a neutral pronoun can be rewritten to avoid the pronoun problem. This helps the students see how easy it is to make substantive revisions (rather than just correcting misspelled words, or adding commas), and that they have choices of strategies when writing that should be based on the effect they wish to create.

6. Students can work with a text selected from their reading materials, finding the major point of each paragraph and putting those together to form a summary of the text. They can print out their summaries and compare them with the summaries produced by other students. This helps them recognize that each carefully constructed paragraph should support one idea, and also helps them with summarization skills.

7. If you have time to put fairly long passages of good writing on the computer, students can use the "search" function to look at examples of how good writers use specific structures. For example, they can find every use of "because", "therefore", etc. in a passage, then analyze the relationships between the ideas in the sentences. This is helpful if you have students who are not showing the logical relationships between ideas in their papers. Some very interesting discoveries can be made this way - when one group of technical writing students checked a file of business letters (easily obtainable

on disk from the administrative offices), they found many instances of the use of the verbless "if possible," "if necessary," and discovered the formulas of openings and closings in business letters.

SHARING WORK

Another benefit of even the most primitive networks is that students can usually save files to a shared disk or subdirectory on the file server and can then access each others' files. This creates many opportunities for peer editing, collaborative work, and for sharing ideas and knowledge. When students are ready to move on to more sophisticated use of the word processor, try the following ideas:

1. Given a topic, students can work in pairs or threes to generate as many thesis statements as they can. These can be printed out and shared with the class, or can be saved to the network file server for others to look at. Students should choose one of the theses from all the generated lists for their own papers.

2. An alternative to 1 that works particularly well when you are working with literature in class, is to put students in groups and assign each group an aspect of the work such as "character", "setting", or "tone". Each group works to brainstorm theses on that aspect. Using a projection system, discuss the theses in class, asking students to determine which are the strongest, most interesting, most likely to generate a good paper. This helps students understand what constitutes a legitimate thesis for a literary analysis paper.

3. Give students the beginning of a line from a poem -- "I wish..." for example. Ask each pair of students to write an ending to the line, then save it to the file server. Instruct students in a file naming convention such as using the student's initials as the extension on the file name, so each file will be distinct and will not overwrite other files. Then pull all the lines together into one file. If you have an overhead projection system linked to a computer, project the files containing all the lines onto a screen. Get students' input in moving the lines around, deleting those that don't fit, until you have a complete poem. Save the poem as a new file so the students can pull it up and play around with it at their stations, changing, adding, or deleting lines. See who comes up with the best poem. This is a good way to introduce students to poetic language, imagery, and to the idea that poetry is an accessible language form for everyone.

CREATING TEXT

Two more extensive uses of word processing for the composition class include *The Progressive Story* and *The Paper Cycle*.

The Progressive Story

Give students, working in small groups, the first sentence of each paragraph of a story, asking them to finish the paragraphs. For example, dictate the following phrase: "Once upon a time, an American tourist came to (their city)... Ask the students to decide if the tourist is a man or a woman, describe the tourist, then describe the view of the city from the air, concentrating on the organization of the physical description. Allow about 15 minutes for this task.

Then dictate the beginning of the second paragraph: "After arriving, the tourist picked up the bags, which were damaged, and then went through customs and out into the late afternoon sun of the city. S/he jumped into the first cab and told the driver to head for the _____ hotel. Only after a few minutes did s/he realize how strange the driver was." Ask the student to describe the cab driver, concentrating particularly on use of vocabulary, especially adjectives. Allow another 15 minutes.

The final part of the story begins, " A hot shower came as a welcome relief. Rested and refreshed, the tourist started out on one of the most romantic and adventurous nights of his/her life." Ask the students to make the rest of the story as interesting as possible. Help out with vocabulary.

Give students a time limit for completing the story. Have them save their stories to the file server using a file naming convention.

Have each group retrieve a text written by another group. One way to approach group editing is to assign each member of the group responsibility for a different aspect of the editing. For example:

Member 1 -- grammatical accuracy.
Member 2 -- strengths and weaknesses of organization.
Member 3 -- quality of vocabulary and creativeness of writing.

The group may make their editing notes with pencil and paper, or if they are using a word processor such as WordPerfect 5.0 which has redlining, strike out, and comment box capabilities, they can edit right on the screen without obliterating the original text.

The group that authored the story can then look at the editing notes, decide what changes they want to make, conference with the editing group if they desire, and revise the story.

As a follow-up activities, print-outs of the stories can be given to all the students to read. High motivation for reading results, as students want to see how other groups dealt with the task, which story is better, etc. Students will pick up new vocabulary and learn about each others' cities from this exercise.

Note: The essential idea behind this lesson is to give students a narrative skeleton on which to hang their creativity while encouraging them to engage in oral discussion to practice written fluency, which is then followed up by peer editing for emphasis on accuracy. This activity was found to produce more and richer oral interaction to take place than group work with a Storyboard activity or an adventure simulation in a study reported on by Martin Phillips (1988).

The topic of the story and the difficulty of the dictated sentences should, of course, be varied as appropriate to the level, age, and interests of the students. The elements of physical description, description of place, narration, etc. can be done in stages, with instructions in the techniques and vocabulary of each, and the final story built up gradually, piece by piece.

If a shorter exercise is desired, give each group of students the opening sentence of a different paragraph of the story. Pull the paragraphs together, and let the groups edit the story.

The Paper Cycle

On one day of the week, Monday, for example, the students work in the lab in pairs to brainstorm ideas for a paper. They should have some guidelines or questions to answer about the topics to stimulate their thinking. You take these printouts home, make comments on whether you think their ideas are sufficient for development of a good paper or not, and return them on Wednesday. You might also read their files from the computer, making your comments directly onto their files, but this is time consuming and tedious if you have a large class. It is usually easier to work from the hardcopy.

The students use the material from the brainstorming session and your comments to write a first draft. This might be due on Friday. You take the drafts home, grade them holistically, and mark one paragraph, aspect, or area of the paper that needs to be revised, with some comments on the nature of the needed revision. If you have taught a particular aspect of writing that week, the comments for revision should probably cover that aspect when applicable. The entire paper should not be marked up for revision, just one paragraph or element.

The following Monday the students meet in the lab. Working from the comments you have made on their rough drafts, the students pull up their papers from their disks and work to revise the indicated areas on each paper. This works best if they are in pairs so they can help each other do the revisions. Ideally, at this point the focus should be on content, organization, paragraph development, etc., not on grammar or mechanics. At the end of the class, they turn in a copy of the old version and a copy of the new. You can quickly check these, indicating whether the revisions made are in the right direction, and return the papers the next class period. The students then have a few days to revise the paper and turn in a final

draft. While this sounds like a lot of grading, it actually takes much less time than a thorough, detailed mark-up of each draft. By the time you get the final draft, most of the problems will be worked out, and you will have fewer corrections to make.

CONFERENCING

Some of the more sophisticate networks allow for the sending of messages directly from one computer screen to another, or for a message to appear on all the computer screens simultaneously. Unless controlled, this direct communication can become chaotic, with everyone typing at once, and disjointed dialogues taking place on the screen. However, it is easy to set up a structured activity in which conferencing provides wonderful opportunities for interactive communication that is not limited by the students' self-consciousness about pronunciation and speaking skills, or dominated by the most outgoing members of the class.

The Interactive Story

First, set up the story. One possibility is to get the students to plan a story which involves four elements: a windy day, a black cat, a rusty key, and a bottle of cider, for example.

One group of students is designated to start the story. Give them a maximum number of lines they can write. As they type, the lines of the story appear on the other groups' screens. When the first group has finished their portion of the story, or reached the maximum, they type four dots.... This signifies that the next group can continue the story- when they are finished, they type four dots...., etc. Appoint a referee to make sure that only one group at a time types, and that each group gets a turn to write. Continue as long as time and interest allow. You may need to insert a line occasionally to restimulate interest.

Note: This activity involves each group of students in creating a part of a greater whole, generating a feeling of communal endeavor facilitated by the computer network. Ideally, the program should have a facility to save the story as a text file when the activity is over. The students can then look at the story as a whole, preferably in hardcopy, and edit it. This allows for accuracy work to be done on a text written for fluency practice, without destroying the creative satisfaction that comes from a free flow of ideas.

Topic Scramble

Each pair or groups of students is assigned a number randomly. The number determines their turn in writing, so Group 1 writes first, Group 2 second, etc.

Then start the students off by typing a topic at the top of the screen. For

example, you might choose the topic "Cats." Group 1 would then write a sentence about cats. Then Group 2 follows with a different sentence. When the last group has finished, start again with Group 1 and continue until the students run out of ideas. Encourage the groups to begin typing as soon as the previous group stops, to encourage a rapid flow of ideas. Groups will vie with each other to come up with unique, interesting sentences.

You might continue with other topics, covering a range suitable to your student group which will generate lots of vocabulary. Save and print the files for sharing, editing, and discussion of vocabulary items that might be unfamiliar to some students in the class.

You can also use this activity as a jumping off point for composition. Students can take the ideas generated and organize them into a paper, providing additional support and details, transitional elements, etc.

IDEAS FOR WANS

If your language program is on or connected to a college or university campus, you probably have access to a Wide Area Network with existing capabilities that can be used to great advantage by your students. The campus probably maintains labs, or "clusters" of microcomputers and terminals linked to the WAN that your students can use with very little instruction. This is an ideal solution for a program that cannot afford to invest in expensive computer lab equipment or salaries for lab assistants. Usage of the terminal clusters and the WAN may be completely free to your program, depending on the size of the institution's computing facilities and the demands on it. Some of the capabilities of a WAN include:

E-Mail - As described above, electronic mail makes sending messages between any two users very easy. It is an excellent way for students and teachers to communicate with each other. Even students who are reluctant to take up a teacher's time by visiting during office hours or calling to ask a question are usually comfortable sending a message via e-mail which the teacher can read whenever convenient. Students are also encouraged to send messages by the anticipation of receiving a personal answer from the teacher or another student. Everyone loves to receive mail, and e-mail can become addictive.

If the institution has access to a national or international e-mail system, it is also possible for your students to send messages to other students far away. You might set up an exchange between your students and those at another language program, instructing your students to gather information on the living conditions, climate, etc. of location of their e-mail pals, then reporting in oral or written form. Students in the two locations might correspond on the impact on their respective areas of some condition such as acid rain, drought, or pollution. They might compare local attitudes toward politics, religion, or education. Or they might compare regional accents and language usage.

Bulletin Boards - On most campuses, WAN's support bulletin boards on which the college students communicate about whatever topics strike their fancy. You may have to get information on these from computer-using students, as the Computer Services Department may not provide assistance with recreational BB's. It is well worth ferreting out this information, however, because BB's may provide your students with the best opportunities for communication practice with native speakers of English. Conducting this kind of communication on a computer is often ideal for second language learners since it eliminates all influence of accent, appearance, etc., and gives them a chance to carefully formulate and edit their messages before posting on the BB. The responses they get will be enormously gratifying, and will often provide insight into the way language is used in casual situations by native speakers of their own age group.

The Georgia Tech Project

At the Georgia Institute of Technology, the Political Science and English departments worked with a computer science student to set up a system on the WAN that serves as an adjunct to class instruction. These system provides several easily accessible services:

- A **Server** on which the instructor can place background files on important people, works of literature, etc. for students to read off the screen or print out.

- A **News** feature which the teacher uses to broadcast news to all members of the class. The News is displayed to users as they sign onto the system. News might consist of items the teacher forgot to tell the students in class, such as to remember to bring certain materials to the next session, or announcements of campus or community speakers and events.

- Access to the **e-mail** system. Although e-mail is available to all users of the WAN, whether they use the Poli. Sci./English system or not, accessibility within the system makes it easier for students to send messages if, for example, they have a question for the teacher about one of the files on the Server.

- **The Forum**. This is the key component of this system. Each course has its own Forum - a bulletin board dedicated to the class members and discussion of class topics. A Political Science Forum consists of discussion of political systems, philosophies, etc. The Literature and Science class uses their board for discussion of science writers and the paradigms they create of the universe.

  In the Freshman Composition class, we have used the Forum as an electronic journal. Instead of requiring students to keep a notebook

with their reactions to the texts we have read, they are required to post their reactions in bulletins on the Forum. The advantage is that they get to read the reactions of other students, and, in turn, to react to those reactions. The result is real communication about the literature that is often far more honest than anything the students are willing to say in the classroom. It is also impossible for a few students to dominate discussion conducted this way, or for others to avoid participation since the instructor keeps track of the messages posted by each student. Shy students are far more comfortable participating in this mode of discussion than they would be in speaking up before the class, and thoughtful students have the time and leisure they need to formulate their responses before posting them.

Freshmen students are sometimes assigned to read the messages on the Political Science boards, which are used mostly by upperclassmen, and to write a response as one of their assignments. This provides them with a real audience for their argumentation, and gives them feedback on how well they have made their points. Upperclass students are often more direct than a teacher would be in proclaiming that the meaning of a message is unclear, its arguments poorly formulated and supported, or its manner of expression pompous. Since the whole interaction is faceless and nameless, the criticism is usually received without the usual defensiveness, and the student will often post several successive messages, gradually clarifying meaning until acceptance is achieved.

An unanticipated result of this assignment has been the mentoring of some freshmen by the upperclassmen through their encounters on the Forum, and the lessening of freshman feelings of isolation and anxiety by the opportunity to communicate with those who "know the ropes."

THE FUTURE OF NETWORKING

Project Jefferson

The Freshman Composition program at the University of Southern California, under the direction of Richard Lacy, has worked with other departments on campus to develop a model of research and instruction that runs on the Macintosh with Hypercard (Chignell and Lacy, 1988). The software uses a notebook metaphor that allows students sitting at a microcomputer to plan, organize, research and write a paper on an assigned topic. The process proceeds as follows:

1. The student answers focus questions on the topic to clarify thinking.

2. Files of background information on the topic are available for browsing.

3. The student can access definitions and additional information on key terms encountered in the background information.

4. Research is conducted by marking terms which results in a set of citations on those terms being gathered from a bibliographic database. The student can read abstracts of the cited reference, and, often, the full text of the reference without leaving the computer work station.

5. All of the above material can be copied into the student's "notebook" and saved on a floppy disk for later access.

6. As the student reads, notes, ideas, musings, etc. can be entered in a section of the "notebook".

7. The student can then enter a word processor to outline and finally write and edit the paper. The reference citations are converted into a word processor file to form the bibliography of the paper.

This tool makes it possible to students to work at a single station and accomplish tasks that used to take hours of time running around to look up references, photocopy articles, write a draft by hand, then laboriously type the final product. It provides immediate access to a wealth of knowledge while creating an atmosphere conducive to reflection and creation rather than frenetic activity. In addition, the word processing and editing tools facilitate the student's interaction with the text.

The only drawback to this system is that it is based on a concept of the learner in isolation - the scholar in the ivory tower surrounded by heavy reference tomes, unaware and unheeding of the world. It does not accommodate, in its current form, a view of learning as a process occurring through the learner's interaction with other learners, experts, and the environment. However, it could easily be adapted to do so. Suppose the writer were able, at any point in the brainstorming and researching process, to send a message to another student or the teacher to ask about puzzling points, or to discuss ideas encountered in the readings. Suppose the brainstorming portion of the process included sessions on a bulletin board where students could compare reactions to the material and argue points in preparation for the arguments to be delivered in the paper, receiving feedback from the other students on the perceived strengths and weaknesses of the arguments, and gaining additional information from the comments of the other students. Suppose the course were being taught on an interdisciplinary basis, with a content teacher in a field such as history or political science, and an writing teacher, both with access to the student's files at various points in the process, both making comments and suggestions to help the student find relevant material, organize it appropriately, present adequate evidence, and express ideas clearly. Suppose the students could easily exchange their drafts by sending the files to each other's computers for reaction, evaluation, and editing.

A system capable of supporting all of these activities would truly begin to harness the power of the computer and of the network as magnificent tools for language learning, for the creation of meaning, and for the development of skilled writers with sophisticated, elegant communicative skills. This is not a far off dream, waiting for unimaginable advancement in technology, but it is an ambitious vision that will require the efforts and cooperation of groups of teachers, computer scientists, software and systems designers, and librarians and researchers from many institutions. The designers of Project Jefferson have taken the first step in making their system available to other institutions through the Kinko's Academic Courseware Exchange. It is cooperative projects like this that will ultimately make computer networks perhaps the finest environment imaginable for teaching and learning language.

BIBLIOGRAPHY

Blyler, Nancy Roundy. (1988). The Components of Purpose and Professional-Communication Pedagogy. *Journal of Technical Writing and Communication, 18:1,* pp. 23-33.

Chignell, Mark H. and Lacy, Richard M. (1988) Project Jefferson: Integrating Research and Instruction. *Academic Computing,* September, pp. 12-45.

Phillips, Martin. (1988). Paper delivered at the International Teachers of English to Speakers of Other Languages Conference, Chicago, March.

Thrush, Emily A. (1987) The Role of the Computer in Language Learning. *Tesol in Action Monograph Series, 2,1.*